

Testing Results of Hall C’s CAEN Modules A1535 and A7435

Mary Ann Antonioli, George Jacobs, and Aaron Brown; Peter Bonneau, Pablo Campero, Brian Eng, Mindy Leffel, Tyler Lemon, Marc McMullen, and Amrit Yegneswaran

Physics Division, Thomas Jefferson National Accelerator Facility, Newport News, VA 23606

March 17, 2021

This note presents the test results of eleven CAEN high voltage modules—four A1535 modules and seven A7435 modules.

Four tests were run on CAEN high voltage modules A1535 and A7435—ramp, trip, current stability, and voltage stability [1]. Beginning with the ramp test, if a module failed, it was not tested further.

Three modules—063, 556, and 766—failed the ramp test. Table I indicates the reasons for failure. Figure 1 shows the failure of module 766, channel 0. Instead of correctly ramping up and down three times, all channels of the module ramped up, held at ~1700 V, then turned off.

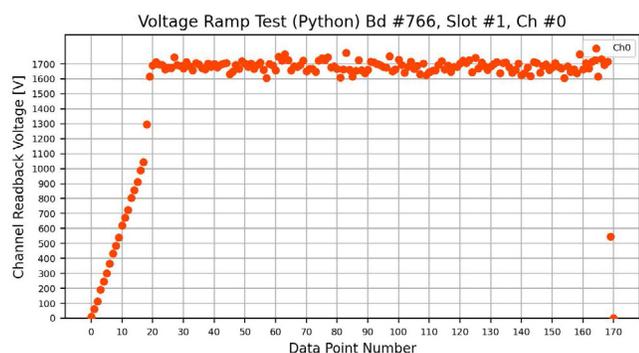


FIG. 1. Voltage ramp test results for module 766, channel 0, showing failure to ramp down properly.

After failure of the ramp test of three modules, the remaining eight modules were trip tested. Of those eight, three failed for having a channel that either did not trip, module 776, or entered the over current state too late, modules 064 and 070, Fig. 2.

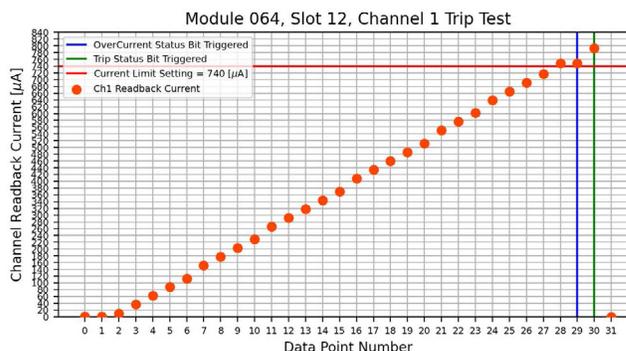


FIG. 2. Trip test results for module 064, channel 1, showing the channel entering the over current state too late before tripping.

After removal from further testing of the three modules that failed the trip test, the remaining five modules were tested for voltage stability and current stability. Module 775 failed both the voltage and the current stability tests, with many channels out of the accuracy range, Fig. 3.

Module	Ramp analysis	Trip analysis	Stability analysis
063	channel 13 does not ramp		
064		channel 1 entered over current state too late	
070		channel 22 entered over current state too late	
081			
082			
083			
094			
556	no data for channels 22 and 23		
766	all channels held at ~1700 V, then turned off		
775			many channels out of accuracy range for voltage and current
776		channel 12 did not trip	

TABLE I. Summary of test results. A red box indicates module failure, a green box passing.

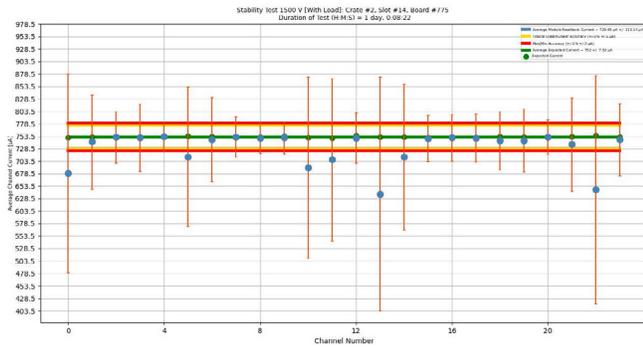


FIG. 3. Current stability testing for module 775, showing channels out of the accuracy range.

In conclusion, four CAEN high voltage modules A1535 and seven CAEN high voltage modules A7435 were tested for ramp, trip, current stability, and voltage stability. Of the eleven modules tested, four A7435 modules passed all tests. The remaining modules failed.

[1] A. Brown, et al., *Report on the Results of the Tests Performed on the CAEN SY4527 Mainframes and A7030TN Modules Procured for the Photomultiplier Tubes of the Neutral Particle Spectrometer*, DSG-Note 2021-03, 2021.